What is claimed is:

1. A method of forming air gaps within an integrated circuit structure, comprising the steps of:

providing a partially fabricated integrated circuit structure and depositing a layer of dielectric thereon;

forming a metal layer on the surface of said dielectric layer;

depositing a thin layer of oxide over the surface of said dielectric layer thereby including said metal layer;

forming the structure for a first layer of cavities over the surface of said thin layer of oxide and aligned with said metal layer said first layer of cavities applying and patterning a layer of nitride followed by applying and patterning a layer of oxide;

forming the structure for a second layer of cavities above and aligned with said structure for said first layer of cavities said second layer of cavities applying and patterning a layer of nitride followed by applying and patterning a layer of oxide;

creating the first and the second layer of cavities;

performing an oxide deposition over the surface of said second layer of cavities thereby creating a thin layer of oxide; and

forming a metal inductor on the surface of said thin layer of oxide.

2. The method of claim 1 wherein said forming a metal layer on the surface of said dielectric layer is forming a layer of metal that has the cross section of a square or a rectangle with essentially vertical sides whereby the height of said metal layer is equal to the thickness of a conventional semiconductor metal layer whereby furthermore the width of said metal layer is equal to or exceeds its height by a measurable amount.

3. The method of claim 1 wherein said forming the structure for a first layer of cavities comprises the steps of:
depositing a first layer of nitride over the surface of said thin layer of oxide;
creating a opening in said first layer of nitride whereby said opening aligns with said metal layer and has a dimension when measured in the direction along the surface of said thin layer of oxide that is smaller than the dimension of the top surface of said metal layer by a measurable amount;
depositing a first layer of oxide over the surface of said first layer of nitride thereby including said opening in said first layer of nitride whereby said first layer of oxide has a dimension of thickness in addition to having a dimension of width; and

creating a first and a second opening in said first layer of oxide whereby said first and second openings are located at the opposite extremities of said first layer of oxide whereby the distance between the central axis of said first and second openings is less that said dimension of width of said first layer of oxide by a measurable amount.

4. The method of claim 1 wherein said forming the structure for a second layer of cavities comprises the steps of:

depositing a second layer of nitride over the surface of said first layer of oxide thereby including said first and second openings in said first layer of oxide;

creating a opening in said second layer of nitride whereby said opening aligns with said metal layer and has a dimension when measured in the direction along the surface of said first layer of oxide that is approximately equal to the dimension of the opening created in said first layer of nitride;

depositing a second layer of oxide over the surface of said second layer of nitride thereby including said opening in said second layer of nitride whereby said second layer of oxide has a dimension of thickness in addition to having a dimension of width; and

creating a first and a second opening in said second layer of oxide whereby said first and second openings are located at

the opposite extremities of said second layer of oxide whereby the distance between the central axis of said first and second openings is less that said dimension of width of said second layer of oxide by a measurable amount.

5. The method of claim 1 wherein said creating the first and the second layer of cavities is removing said first and second layer of nitride said removal to take place by accessing said first and second layer of nitride by means of said first and second opening in said second layer of oxide furthermore by accessing said first layer of nitride by means of said first and second openings in said first layer of oxide.

6. The method of claim 1 wherein said performing an oxide deposition over the surface of said second layer of cavities is creating a thin layer of oxide over the surface of said second layer of oxide thereby furthermore closing off said first and said second openings in said second layer of oxide.

7. The method of claim 1 whereby this method is further extended to create additional layers of cavities over a preceding layer of cavities said extension to occur prior to performing an oxide deposition over the surface of the upper

or last layer of cavities whereby the creation of each additional layer of cavities comprises the steps of:

depositing an additional layer of nitride over the surface of the layer of oxide of the preceding layer of cavities thereby including the first and second openings in said layer of oxide of the preceding layer of cavities;

creating a opening in said additional layer of nitride whereby said opening aligns with said metal layer and has a dimension when measured in the direction along the surface of said layer of oxide of the preceding layer of cavities that is approximately equal to the dimension of the opening created in the preceding layer of nitride;

depositing an additional layer of oxide over the surface of said additional layer of nitride thereby including said opening in said additional layer of nitride whereby said additional layer of oxide has a dimension of thickness in addition to having a dimension of width; and

creating a first and a second opening in said additional layer of oxide whereby said first and second openings are located at the opposite extremities of said additional layer of oxide whereby the distance between the central axis of said first and second openings is less that said dimension of width of said additional layer of oxide by a measurable amount.

8. The method of claim 1 wherein said layers of nitride are replaced by layers of a disposable solid.

9. The method of claim 8 wherein said disposable solid layer is a polymer and whereby said removing said disposable solid layer is heating said substrate in oxygen thereby evaporating said disposable solid layer thereby disposing the polymer using O_2 plasma.

10. The method of claim 8 wherein removing said disposable solid layer is introducing a solvent to said substrate thereby dissolving said disposable solid layer.

11. The method of claim 8 wherein removing said disposable solid layer is heating said substrate thereby evaporating said disposable solid layer.

12. The method of claim 11 wherein removing said disposable solid layer is applying a vacuum to said substrate thereby dissolving said disposable solid layer.

13. The method of claim 1 wherein furthermore an insulating layer is deposited over the surface of said inductor thereby encapsulating said inductor.

14.The method of claim 1 wherein said partially fabricated integrated circuit structure contains transistors wherein said transistors are bipolar or CMOS and are interconnected to form and RF amplifier.

15. The method of claim 1 wherein said inductor is spiral shaped.

16. The method of claim 15 wherein said spiral of said inductor is of circular or polygonal shape.

17. The method of claim 16 wherein the polygonal shape of said inductor includes the shapes of a square, a hexagon and an octagon.

18. The method of claim 1 wherein said inductor has an inductance in excess of 1 nH and a self-resonance in excess of 10 MHz.

19. A multilevel structure containing horizontal air cavities in support of a metal inductor, containing:
a semiconductor surface that has been provided with a metal point of electrical reference or that functions as an inner port on its the surface;

a thin layer of oxide overlying said semiconductor surface thereby including the exposed surfaces of said metal point of electrical reference or inner port;

a first horizontal cavity overlying said thin layer of oxide whereby said first horizontal cavity is discontinued above said metal point of electrical reference or inner port;

a first layer of dielectric overlying said first horizontal cavity including said regions of discontinuance of said first horizontal cavity;

vertical openings in said first layer of dielectric that are located at the near extremities of said first layer of dielectric;

a second horizontal cavity overlying said first layer of dielectric whereby said second horizontal cavity is discontinued above said metal point of electrical reference or inner port;

a second layer of dielectric overlying said second horizontal cavity including said regions of discontinuance of said second horizontal cavity;

vertical openings in said second layer of dielectric located at the near extremities of said second layer of dielectric; and

a thin layer of oxide overlying said second layer of dielectric.

20. The structure of claim 19 whereby said structure is further extended to include an inductor on the surface of said thin layer of oxide.

21. The structure of claim 19 whereby said structure is further extended to include additional layers of horizontal air cavities in support of a metal inductor each layer containing one horizontal cavity and one layer of dielectric overlying said horizontal cavity with each horizontal cavity being discontinued above said metal point of electrical reference or inner port whereby furthermore each dielectric layer is provided with vertical openings located at the near extremities of said layer of dielectric said additional layers of horizontal air cavities to be located underneath said thin layer of oxide overlying the upper or last layer of dielectric.

add C6 1